ZK60G120G

N-channel Enhancement Mode Power MOSFET

Features

- Very Low On-resistance RDS(ON)
- Low Crss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

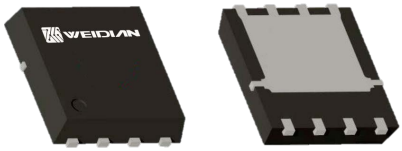
Product Summary

Parameters	Value	Unit
V_{DSS}	60	V
$V_{GS(th)\_Typ}$	1.6	V
I_D(@V_{GS}=10V)	120	A
$R_{DS(ON)\_Typ}$(@V_{GS}=10V	2.3	mΩ
$R_{DS(ON)\_Typ}$(@V_{GS}=4.5V	3.1	mΩ

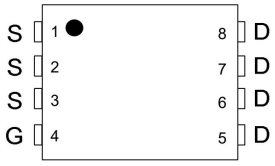
Applications

- PWM Application
- Load Switch
- Power Management

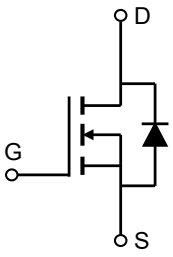
Top View **Bottom View**



PDFN5x6-8L



Marking



Schematic Diagram

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK60G120G	60G120	DFN5x6	Reel	N/A	N/A	5000

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25°C	I_D	120	A
	T_C = 100°C		73	
Pulsed Drain Current		I_{DM}	360	A
Single Pulsed Avalanche Energy		E_{AS}	280	mJ
Power Dissipation		P_D	96	W
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.3	℃/W
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)\,DSS}$	V_{GS} = 0V, I_D = 1mA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 60V, V_{GS} =0V			90	nA
Gate-body leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} =±20V			±100	nA
On characteristics						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250uA	1.1	1.6	2.1	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		2.3	2.4	mΩ
		V_{GS} =4.5V, I_D =20A		3.1	3.2	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} =30V,V_{GS} =0V f =1MHz		4240		pF
Output capacitance	C_{oss}			770		
Reverse transfer capacitance	C_{rss}			16		
Gate Poly Resistance	R_g	f =1MHz		1.5		Ω
Switching characteristics						
Total gate charge	Q_g	V_{GS}=0 to 10V V_{DS}=30V, I_D=30A		64		nC
Gate-source charge	Q_{gs}			16		
Gate-drain charge	Q_{gd}			14		
Turn-on delay time	$t_{d(on)}$	V_{DS}=30V,I_D=10A V_{GS}=10V,R_{GEN}=3.5Ω		23		ns
Turn-on rise time	t_r			19		
Turn-off delay time	$t_{d(off)}$			39		
Turn-off fall time	t_f			9		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD} ④	V_{GS} =0V, I_S=1A			1.2	V
Continuous drain-source diode forward current	I_S ①	T_C =25℃			120	A
Reverse recovery time	trr	di/dt = 500A/μs, I_S = 20A		28		ns
Reverse recovery charge	Qrr			136		nC

Notes:

1.Repetitive Rating : Pulse width limited by maximum junction temperature
2.VDD =20V,L=0.5mH, Starting TJ = 25°C
3.Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
4.Essentially independent of operating temperature

Typical Electrical & Thermal Characteristics

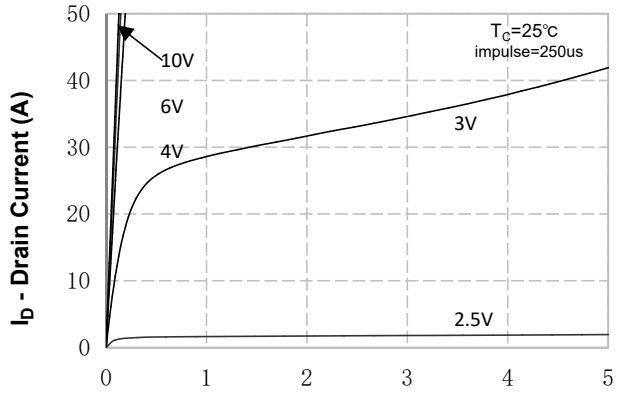


Figure 1. On-Region Characteristics

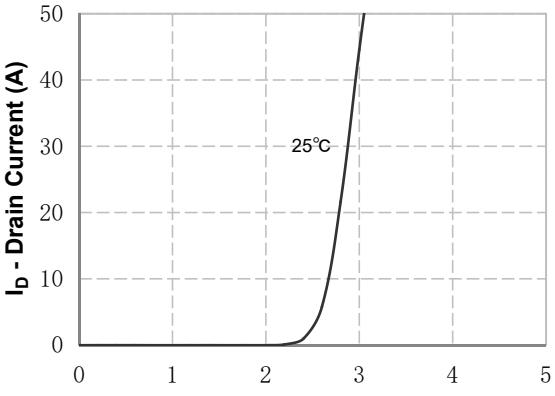


Figure 2. Transfer Characteristics

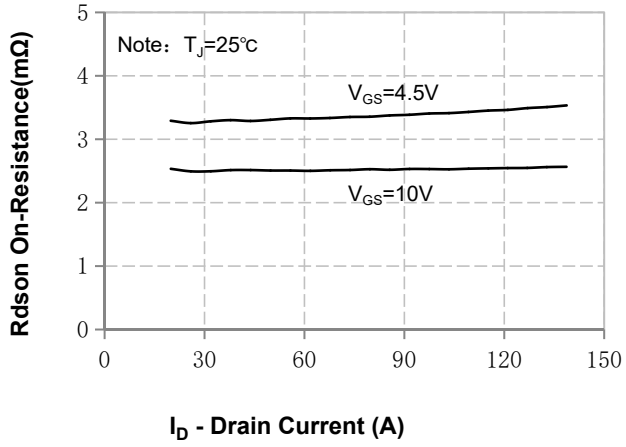


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

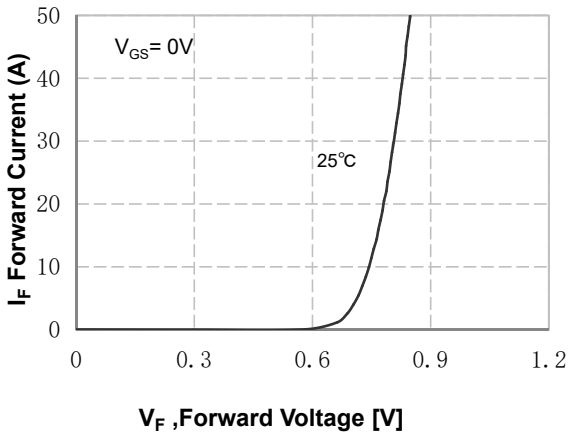


Figure 4. Body Diode Forward Voltage Variation vs Source Current

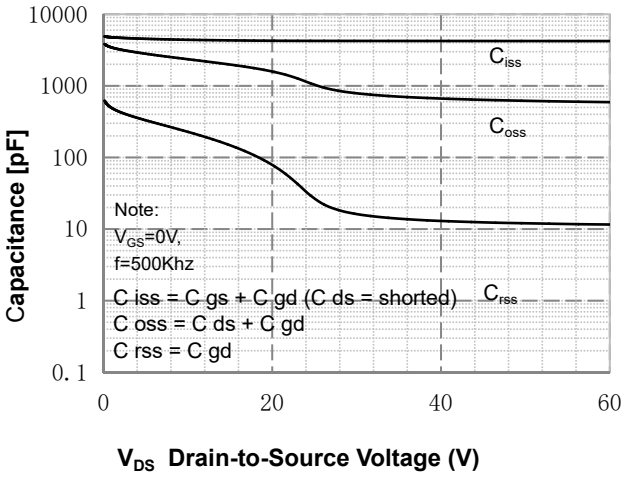


Figure 5. Capacitance Characteristics

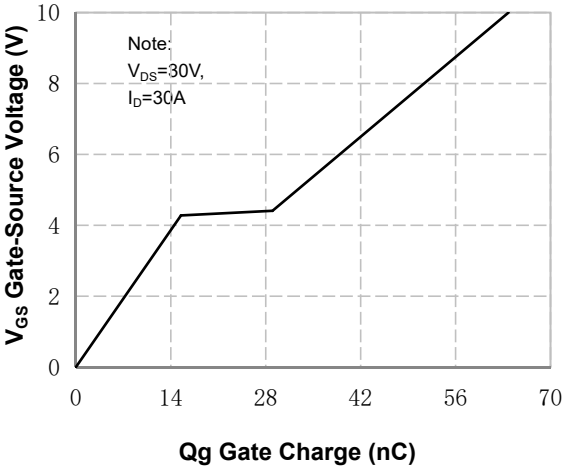


Figure 6. Gate Charge Characteristics

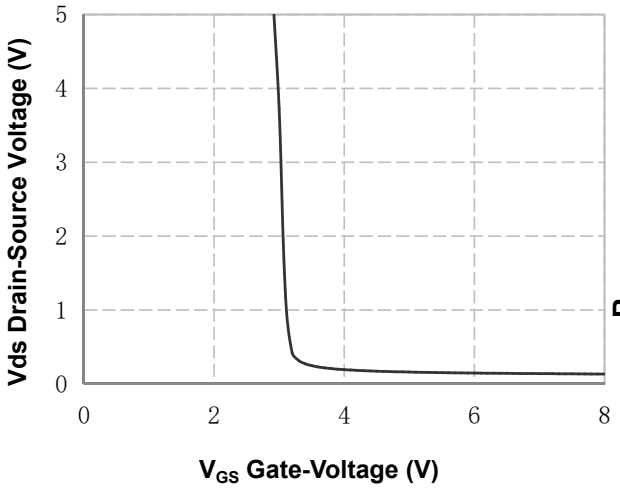


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

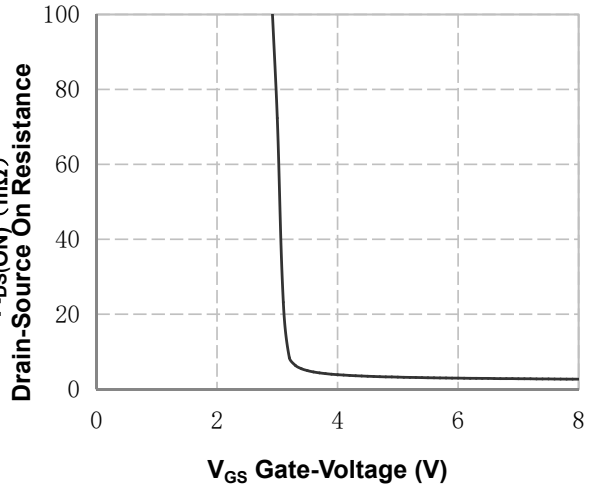


Figure 8. On-Resistance vs Gate Voltage

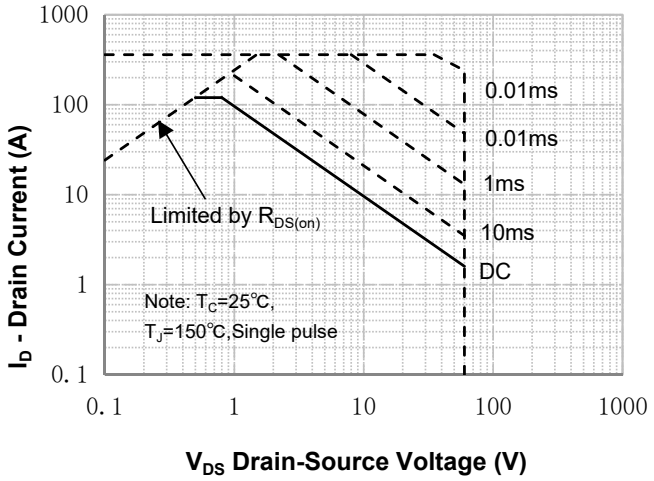


Figure 9. Maximum Safe Operating Area

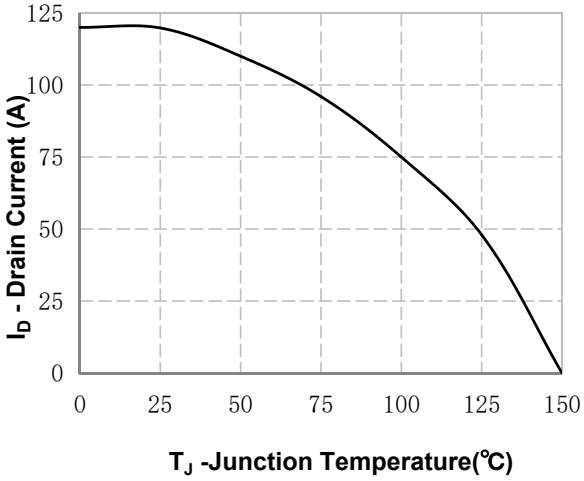


Figure 10. Maximum Continuous Drain Current vs Temperature

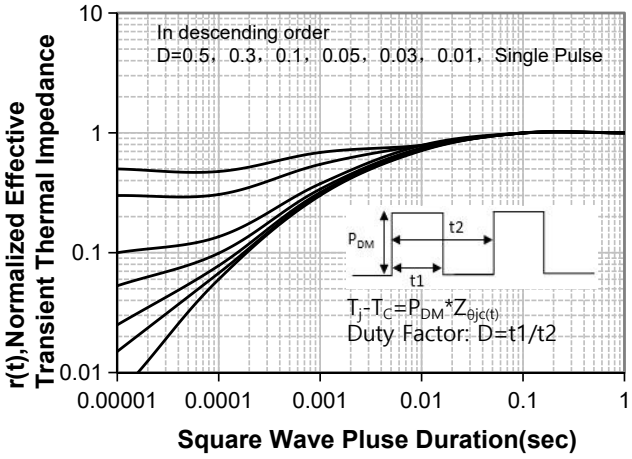
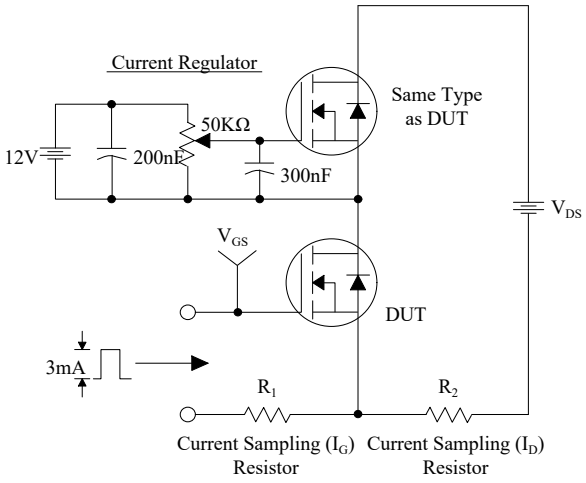
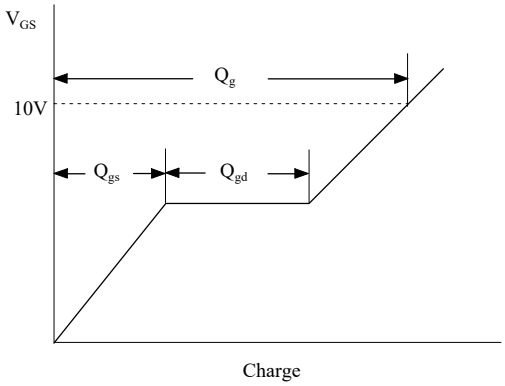


Figure 11. Transient Thermal Response Curve

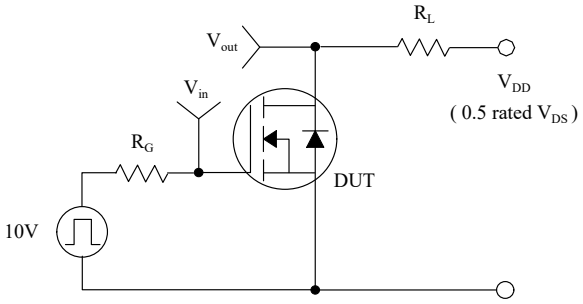
Test Circuit

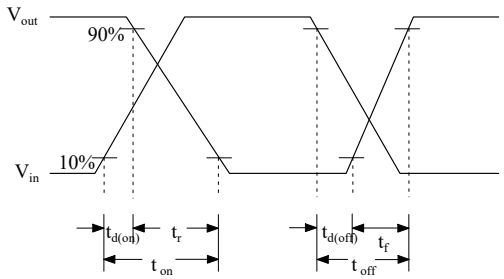
Gate Charge Test Circuit & Waveform



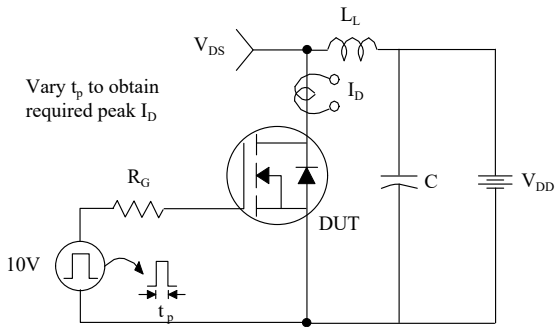


Resistive Switching Test Circuit & Waveforms

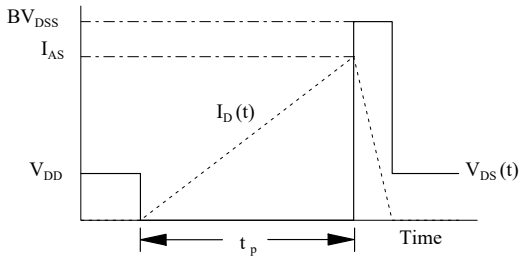




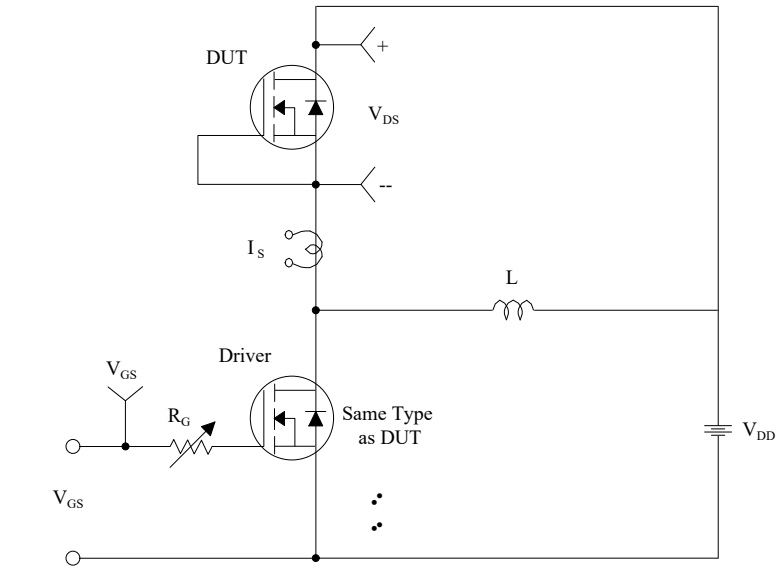
Unclamped Inductive Switching Test Circuit & Waveforms

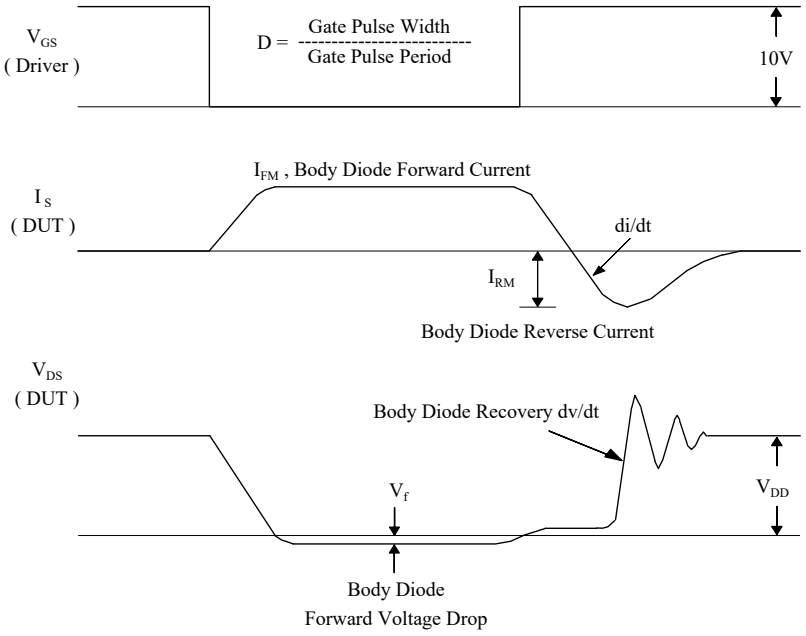


$$E_{AS} = \frac{1}{2} L_L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

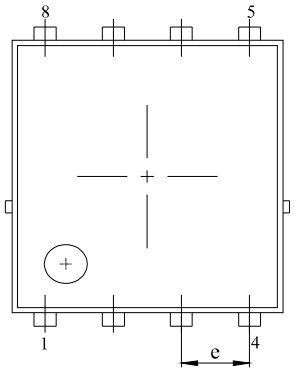


Peak Diode Recovery dv/dt Test Circuit & Waveforms

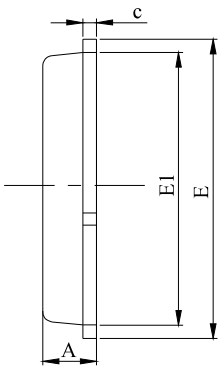




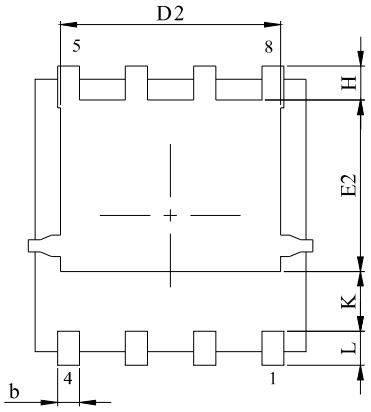
Package Mechanical Data(PDFN5x6-8L)



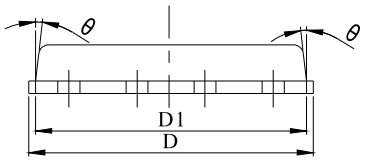
Top View



Side View



Bottom View



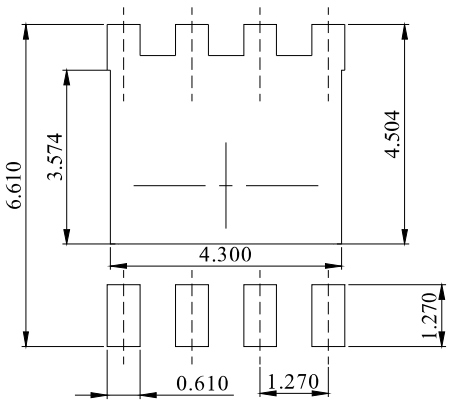
Front View

NOTES:

1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).
3. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K	1.23 REF		
θ	-	-	10°

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS